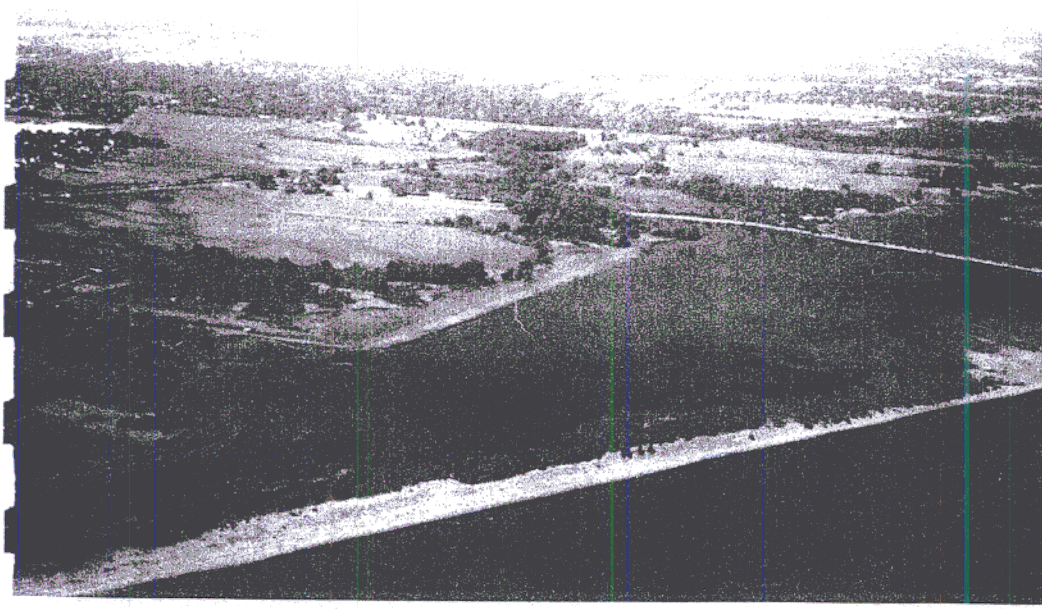

GRAY & PAPE
INC.
CULTURAL RESOURCES CONSULTANTS

OCTOBER 12, 2001

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Project # 01-39101

October 12, 2001

PHASE I CULTURAL RESOURCES INVESTIGATIONS OF THE EAST SANDUSKY BAY HYDROLOGY RESTORATION PROJECT IN ERIE COUNTY, OHIO

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ABSTRACT

On October 5, 2001, Gray & Pape, Inc., conducted a Phase I cultural resource survey for Barnes Nursery, Inc., in Huron, Huron Township, Erie County, Ohio. This Phase I cultural resources investigation was designed to identify and preliminarily assess cultural resources located within the project area. Cultural resources investigations were limited to the area of construction associated with the East Sandusky Bay Hydrology Restoration Project and a 15-meter (50-foot) buffer to either side of hydrologic channel and dike constructions.

Archaeological survey resulted in the identification of Sites 33Er497 and 33Er498. Site 33ER497 consists of a scatter of prehistoric artifacts covering approximately 450 meters^2 (4844 feet^2). Site 33Er498 consists of a scatter of prehistoric artifacts covering approximately 600 meters^2 (6458 feet^2). Identification of Sites 33Er497 and 33Er498 is directly linked to mechanical excavation activities used to construct the East Sandusky Bay Hydrology Restoration Project. The recovery of chert debitage, 3 utilized flakes, and 1 fragment of fire-cracked rock indicate prehistoric human activity within the project area. However, because these artifacts were discovered in a matrix of deep lacustrine lake clays it is difficult, if not impossible, to interpret their context. At present, contextual integrity of the artifacts representing these two sites is sufficiently vague as to jeopardize further research value. Therefore, Sites 33Er497 and 33Er498 do not meet criteria for National Register Historic Place eligibility.

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CHAPTER I. INTRODUCTION

This report presents the results of archaeological resource identification efforts associated with the East Sandusky Bay Hydrology Restoration Project, Huron Township, Erie County, Ohio (Figure 1). Barnes Nursery, Inc., seeks after-the-fact authorization through application to the US Army Corps of Engineers, Buffalo District (Buffalo District), for an individual permit to construct a deep water channel to help restore some original hydrology to the east bay. The proposed project consists of three primary elements:

(1) a hydrologic channel 1,500 feet long, 50 feet wide, and 5 feet deep;

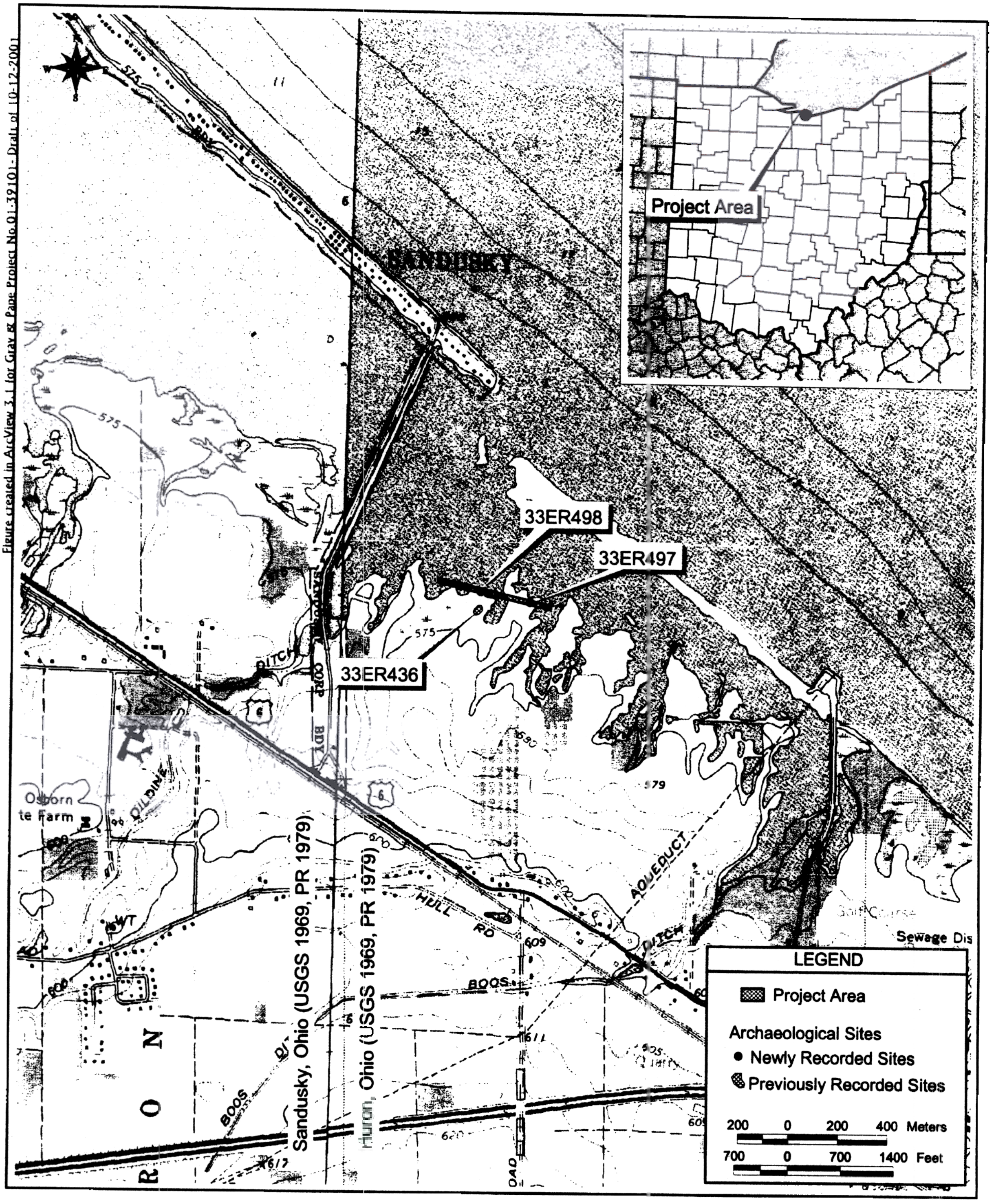
(2) a series of 5 islands with a total linear length of about 1,500 feet, each island 60 feet wide, 6 feet high, and with a 4-to-1 slope (run to rise) on all sides (*referred to as a "dike" in this report)*; and

(3) a narrow feeder channel 500 feet long, 3 feet wide, and 1.5 feet deep which connects to an existing, natural circulation channel.

Activities associated with this project were initiated under Nationwide Permit No. 27 issued by the Buffalo District on 20 June 2000. Most of the work to construct elements 1 and 2 was completed in July 2000. On 27 July 2000, the Buffalo District informed Barnes Nursery that this work exceeded the terms and conditions of the NW 27 permit, and work on the project was halted. On 6 November 2000, the Buffalo District suspended authorization of the NW 27 permit. Barnes Nursery elected to remedy this situation by applying for an Individual permit from the Buffalo District (Application No. 2000-02170), submitted 13 March 2001.

Agency consultations in accordance with provisions of the National Historic Preservation Act of 1966, as amended (36 CFR 800), were initiated with correspondence from the Buffalo District to the Ohio Historic Preservation Office (OHPO), dated 11 May 2001. OHPO's response, dated 8 June 2001, requested additional information regarding how the excavation of the ditch is connected to the water supply for the nursery; possible effects of the project on Site 33Er436; and regulatory issues concerning the review process. In their correspondence to OHPO, dated 27 September 2001, the Buffalo District stipulates their requirement for a Phase I archaeological survey and defines the Area of Potential Effect (APE) as "limited to the area of ground disturbance, the intake channel leading to the pump house, and a buffer zone of 20 yards surrounding these areas."

Barnes Nursery contracted with Gray & Pape, Inc. (Gray & Pape), Cincinnati, Ohio, to conduct the Phase I archaeological survey for the project. On 3 October 2001, discussions were held with Dr. David Snyder (OHPO) regarding the nature of the project and appropriate approaches to the identification of archaeological resources in the APE. The discussion focused on the fact that several factors unique to this project would require a somewhat unconventional archaeological survey techniques: that channel construction has been essentially completed, and that the project's setting is wetlands and cyclically inundated mudflats.



Location of Project Area Including
Previously Recorded and Newly Recorded Sites
In Huron Township, Erie County, Ohio

GRAY & PAPE INC.
CULTURAL RESOURCES CONSULTANTS

Figure 1

Through this discussion, we agreed that the project might present an opportunity to identify archaeological resources in a near-shore setting that would otherwise not be possible had dike construction not already begun. Near-shore and cyclically inundated settings are significantly under-represented in traditional archaeological surveys, and are not necessarily amenable to traditional archaeological survey techniques. Working from the knowledge that the dike was constructed with lacustrine sediments excavated from the channel, Dr. Snyder agreed that it might be possible to identify potential archaeological resources by walking the dike and observing its barren surface to look for artifacts. The implementation of this approach and an assessment of its usefulness for identifying archaeological sites became the focus of the Phase I survey.

The discussion with Dr. Snyder also touched on OHPO's question about how the excavation of the ditch is connected to the water supply for the nursery. Sharon Barnes, (personal communication, 4 October 2001) stated that there would be no construction activity associated with the pump house. The intake channel to this facility forms the base of the "L" configuration of the project's hydrologic channel. It was constructed in the 1970s and widened in 1999. The pump house is located approximately 50 feet south of the intake channel and is fed by a large gravity pipe.

REPORT ORGANIZATION

This report is organized into 6 numbered chapters and 2 lettered appendices. Chapter I provides an overview of the project and summarizes various administrative details. Chapter II presents a brief review of the natural setting of the project area. Chapter III provides the cultural context of the region. Chapter IV presents the project research design and methods, including both field and laboratory techniques and classificatory criteria. Chapter V provides the results of the Phase I survey and presents descriptions of the resources identified. Chapter VI presents the conclusions of the study. Appendix A provides pertinent information from Permit Application No. 2000-02170. Appendix B contains the prehistoric artifact inventory for the sites discussed in the report.

ACKNOWLEDGMENTS

Field investigations for this project were conducted by Jim Pritchard. Mr. Pritchard wrote the report survey methods, field results, and recommendations, and contributed to the environmental overview chapter; Lora Arduser prepared the environmental and cultural overview chapters, and assisted with editing and report production. Mr. W. Kevin Pape served as the Project Manager. Artifact analysis was undertaken by Patrick Bennett. Casey Fagin and Ruth Meyers prepared the figures and photographs. Michele Collins produced the report.

CHAPTER II. ENVIRONMENTAL SETTING

Human societies at all levels of complexity are linked to the natural environment in an ecological relationship. This relationship can be viewed as the use of organic and inorganic resources present in the environment, combined with the strategies employed for the procurement of those resources. The environmental limits which define the settlement and subsistence options available to social groups can be seen in terms of a realm of interaction that ranges from regional to local in scope. Considerations of climate, vegetation, soils and geomorphological setting may be viewed in a regional frame as they influence distributions of groups; locally, these factors affect site selection and the subsequent preservation of cultural deposits.

PHYSIOGRAPHY AND GEOMORPHOLOGY

Erie County is located in the Lake Plain physiographic section of Ohio and was subjected to glaciation during both the Illinoisan and the Wisconsinan periods. Approximately two-thirds of the county was once covered by a glacial lake, and many landscape features such as the beach ridges and wave-cut cliffs are results of wave action. The county is drained by small streams and two rivers that flow into Lake Erie (USDA 1971).

Current elevations in the county range from 576 to 870 feet. There is a rise in elevation moving from north to south in the county. The project area is located in the lowest elevation, the marshy area along East Sandusky Bay, which is across from Cedar Point, the largest sand deposit (7 miles) along the Ohio shore of Lake Erie.

Sheldon Marsh, which is located to the east of the APE, "represents one of the last and probably best example in Ohio of a naturally functioning Lake Erie wetland and barrier beach system" (ODNR 20001: 3). Since 1972, however, the barrier at Sheldon Marsh has retreated approximately 259 meters (850 feet). This has resulted in the destruction of the previous barrier beach road to Cedar Point (Plate 1). The migration of the Cedar Point bar has restricted the hydrology of this portion of East Sandusky Bay, burying channels within the marsh beneath an expansive mud flat. Such changes have potentially degraded the hydrology of this unique complex.

Opposing views have been put forth regarding changes to the marsh system. Sheldon Marsh is under passive management, that is, the wetlands have been allowed to freely migrate with fluctuations in Lake Erie water levels. ODNR, through its Division of Natural Areas and Preserves (DNAP), seeks to protect the marsh in as natural a state as possible without the intervention of improvement measures that seek to correct what may be seen as negative changes in the system. Passive management, thus, allows for environmental change recognizing the inherent dynamism of ecological systems. Change is seen as part of the natural, and potentially cyclical, transformation of this unique environment.

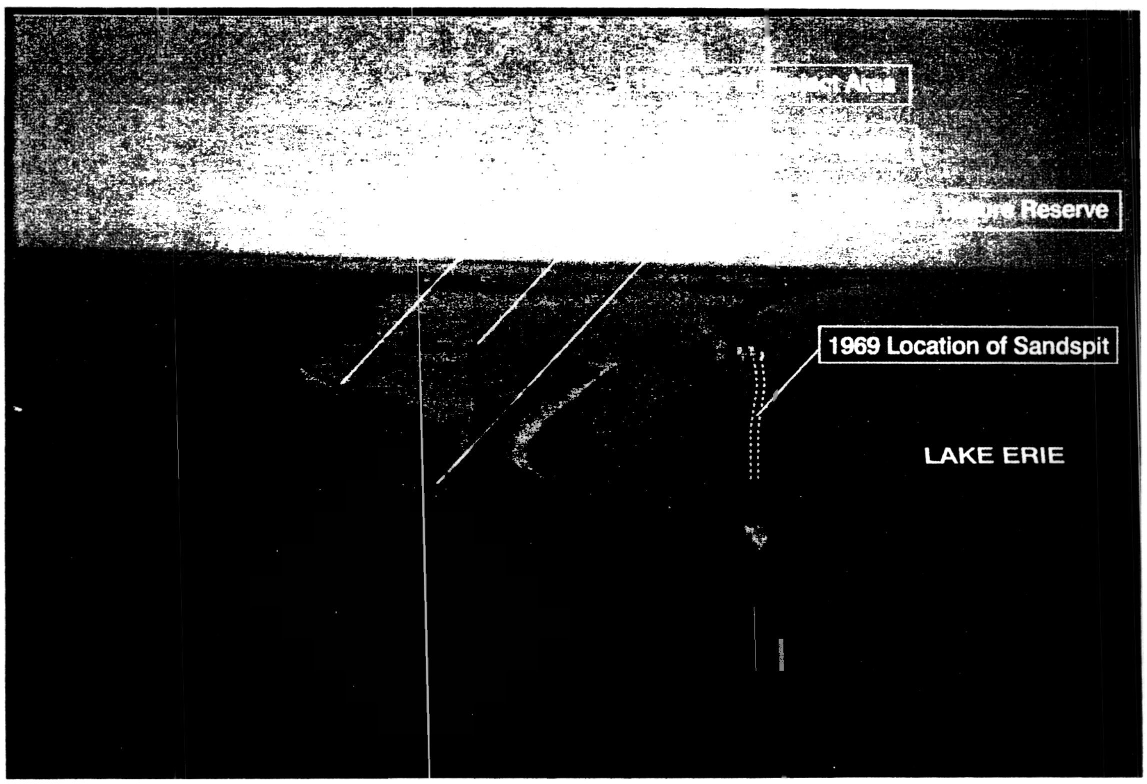


Plate 1. Aerial photograph showing project area and landward migration of Cedar Point bar, in East Sandusky Bay.

Conversely, passive management can been seen as a negligent contribution to East Sandusky Bay's degradation. Observation of the USGS Topographic Map (1901) Sandusky Quadrangle, Ohio, suggests that in the past century, the project area fell within a sheltered wetlands system that was protected by a long, narrow sandspit and barrier beach to the north. In the past 3 decades this sandspit has been breached by storms (e.g. 1987), migrated 259 meters (850 feet) landward, and subsequently altered the hydrology of East Sandusky Bay, exposing the wetland system to fluctuations in water levels and further impacts by storms. Drastic alterations to the area are apparent when consulting maps that predate 1987. Use of the USGS Topographic Map (1969) Huron Quadrangle, Ohio identifies the project area as crossing land, as does the 1979 photo update. However, continued alteration of the bay shore since 1979 has resulted in the project area migrating lakeward (See Appendix A).

Such changes to the wetlands and barrier beach system in turn affect those businesses along the Bay that rely on the natural resources of the area. The East Sandusky Bay Hydrology Restoration Project has been a response by Barnes Nursery to what they perceive as a water volume threat. The nursery requires some 350,000 gallons of water nightly. Changes to the hydrology of the bay, they argue, have necessitated the restoration of water flow through the mudflats within East Sandusky Bay. The nursery sees the project as an opportunity to reverse the negative impacts of environmental change to the project area, including the restoration of avifauna habitat and the re-establishment of water flow.

EARLY LAKE ERIE

The fluctuating levels of proto-Lake Erie subsequent to the last glacial advance created significant changes in the land available for early prehistoric occupation through time. Evidence indicates that different landscapes were available between the earliest retreat of the last glacier and a period approximately 9000 to 10,000 years B.P., times corresponding to the Paleoindian and Archaic periods.

Geologists have established a series of high-level glacial lake stages which occupied the Erie basin: Maumee, Whittlesey, Arkona, Warren, and Lundy. These early lakes were prevented from draining northwestwards by ice sheets which occupied the Ontario and eastern Erie basins. Before the ice retreated and allowed drainage across the Niagara escarpment, lake levels ranged between 670 and 780 feet AMSL, compared to the present lake stage of 571 feet. Evidence for these high levels is present today in sandy beach ridges which run, discontinuously, across the northern portion of the country.

After the retreat of the glacier, lake drainage was to the east through New York and into the Ontario basin. As a result of this new outlet, the lake level dropped significantly from approximately 12,900 to 12,660 years B.P. to form Early Lake Erie (White 1982). The differential vertical uplift of this outlet channel, controlled by the rebound of the glacially depressed surface, played amajor role in determining the low-level stages in central and western Lake Erie. Studies of lake sediments and the uplift curve (calculated by age and elevation of shoreline boundaries) of the lake outlet indicate that when Early Lake Erie began, water levels were as much as 30 meters (100 feet) below the present lake level. As a result, the central and western regions of the lake were drained, allowing plant detritus to accumulate in shallow ponds (Lewis et al. 1966).

The low-lake stage was short lived, however, due to uplifting at the Buffalo outlet, causing water to flood the drained parts of the lake basin. Current research indicates that during this time (ca. 11,000 to 4000 years ago) the Western Basin of Lake Erie was a dry lake bed joined with the mainland (Forsyth 1973; Larsen 1999).

As the Niagra Falls area began to rebound and uplift, less water drained out of the lake and water levels began to rise to current levels. Forsyth (1973) has argued that, as a result of the isostatic rebound and the gradual raising of water levels, the Western Basin again became inundated approximately 3500 to 4000 years ago.

SOILS

Soil type appears to play a very important role in determining the distribution of human groups on a large scale and settlement locations on a small scale. Certain types of soils were preferred over others by early settlers and aborigines alike. Quite often, vegetational indicators were surveyed to determine soil fertility and moisture prior to migration and frontier settlement. Soil acidity, drainage, and deposition also play a major role in the way that sites were formed and subsequently preserved.

Soils in the project area are of the Marsh and Beaches Association (USDA 1971). These soils occur in scattered areas adjacent to Lake Erie. Marshes are slightly below the level of the lake and level fluctuations result in the growth of cattails and other marsh vegetation. Specifically, the project area consists of soils classified as Beaches, Wet Beaches , and Marshes.

Beaches are composed of well-drained sandy material that is likely to be shifted by wind and water. These soils consist of layers of sand of various sizes and fine gravel. Each layer has a slightly different color; the uppermost layer (5 to 15 centimeters [2 to 6 inches]) is typically darker than the other layers. The sand extends to depths of more than 152 centimeters (60 inches) and the slope range is 0-12%. Wet beaches occur in low areas along the shore of Lake Erie. In these areas the water table is within 38 centimeters (15 inches) of the surface for part of the year. Some of these areas become inundated at times depending on the water level of Lake Erie and the wind direction. Slope in these soils is less than 2%, and the uppermost 2.5 to 20 centimeters (1 to 8 inches) has been darkened to black or gray by organic staining. Underlying material is made of thin layers of gray to brown sand mottled with yellowish brown.

Marshes also occur along the shore of Lake Erie, including the areas at the mouth of the Huron River and Old Woman Creek. These areas are submerged part of the year. The soil material underlying Marshes varies. In areas east of Sandusky it is similar to materials in the lower part of the profile of Lenawee and Colwood soils. These areas are good wildlife habitat.

CLIMATE

The climate of Erie County, Ohio, is characterized by large, annual and daily ranges in temperature. Rainfall is well distributed through the year and abundant, but it varies from year to year. The average annual precipitation is 34 inches; most precipitation in winter is rain. In the Sandusky area, the average minimum and maximum temperatures in summer ranges from the low 60s to the mid 80s. Winter minimum and maximum temperatures range from 20^0 to 50^0. The highest temperature generally occurs in mid June, while the lowest occurs in mid to late December

The lake has a modifying effect on the weather in the northern part of the county. Winds off the lake lower the temperatures in the summer and raise them in the winter. The lake also effects the intervals between freezing temperatures: this interval decreases as distance from the lake increase. The interval is 198 days in Sandusky compared to 168 days in Castalia, approximately 6 miles to the southwest.

FLORA AND FAUNA

The earliest post-glacial vegetational cover in the Lake Erie Basin was a boreal parkland consisting of pine, spruce, fir, and aspen. This was superseded by a forest environment of deciduous hardwoods as the climate became drier and warmer.

The earliest official surveying of Ohio was begun in 1786 by Thomas Hutchins, Geographer of the United States (Sears 1925:1139). Based on a variety of early survey data and historical records, Sears prepared the first reconstruction of Ohio's natural vegetation. Gordon (1966, 1969), elaborating on that work, describes the natural vegetation of the study area as consisting of Oak-Sugar Maple Forest. These included xero-mesophytic forests usually lacking beech,chestnut, red maple and tulip tree. Dominants included white oak, red oak, black walnut, and black maple as well as the sugar maple, white ash, red elm, basswood, bitternut and shagbark hickories. Of indicator value today in the areas formerly occupied by these forests are Ohio buckeye, northern hackberry, honey locust and blue ash. A local vegetation survey identified 50 types of vegetation in the project area, including box-elder, creeping thistle, horseweed, filed mint, witch grass, Canada golden-rod, and eastern cottonwood (Herdendorf 2001).

The area's habitats support a number of animal species. Amphibians, reptiles, birds, molluscs, insects, and fish are all represented, including some rare and notorious species. The western basin of Lake Erie is one of the most productive bodies of water in North America. Acting as a large estuarial bay, it encompasses only 5.1 percent of the total lake volume, yet it yields two-thirds of the lake's total catch of fish (Langlois 1954). The total catch from the lake has varied greatly throughout the years with sustained highs and lows lasting several years. These fluctuations have usually been species specific which accounts for the fluctuating popularity of different kinds of commercial fish over the years.

CHAPTER III. CULTURAL OVERVIEW

The following discussion serves as a synthesis of various sources regarding the known prehistory and history of northcentral to northwestern Ohio. Pertinent regional information can provide a framework within which the problem of site significance may be addressed as well as suggest certain research questions that may be formulated concerning the cultural resources of the study area. In reviewing the literature devoted to the archaeological resources of this region, an informative background is developed that helps to reveal problems and hypotheses offering an appropriate fit between these research questions, the data base, and project parameters.

PALEOINDIAN OCCUPATION (14,000 to 8000 B.C.

Most of what is known about this earliest cultural development must be inferred from sparse surface recoveries of artifacts, particularly the diagnostic fluted points (Dorwin 1966; Prufer and Baby 1963). This information can be analyzed in conjunction with geochronological and paleoecological data to make generalized assumptions about the earliest post-Pleistocene inhabitants. Post-Pleistocene adaptive strategies were geared for coping with a harsh but rapidly changing environment. In general, Paleoindian sites are reflective of areas where small groups of people would perform specific tasks of short duration. This type of site maintains a very low archaeological profile across the landscape. It has been argued that the earliest subsistence strategies in the northeast were characterized by a balanced hunting economy based on the exploitation of migratory game, especially caribou, and supplemented by foraged food (Fitting 1965:103-4; Ritchie and Funk 1973:336).

The proximal location of the study area to Lake Erie is significant. Shifting post-Pleistocene glacial conditions in the Paleoindian period resulted in a series of shoreline changes, lake/beach formations, changing wind and precipitation patterns, and a succession of different and more hospitable environments. Along the glacial margin, a 160- to 320-kilometer (100- to 200-mile) zone of park tundra probably existed. As the boundary of this tundra shifted, so did the latitudinal zonation of plant and animal ecotones. During the final retreat there was the succession of spruce-fir to pine to broadleaf forests (Mason 1981). The new environment no longer supported mammoth-mastodon. Caribou, deer, elk, and bear migrated into the area. Concomitant changes in human carrying capacity would be expected along these glacial margins (Funk 1978).

The Paleoindian period in the Western Basin, within which the study area is included, is represented almost exclusively from surface finds of fluted and non-fluted Plano points in a variety of physiographic settings (Stothers 1982). Prufer and Baby (1963) have noted the majority of the unfluted Plano points do come from northern and more specifically northwestern, Ohio. The earliest occupation of this area is believed to have occurred around 11,000 to 10,000 B.C. (Pratt and Croninger 1986). At the Holland-Sylvania site, Paleoindian fluted and non-fluted points of local chert and, non-local Upper Mercer chert were found in association with pits containing charcoal dating between 8000 and 6500 B.C. (Stothers 1973). Other Western Basin sites have also produced both types of points from temporary camps dating between 10,500 to 7000 B.C. (Stothers 1977; Stothers and Campling 1974).

As nomadic hunters, the Paleoindian groups exploited annual territories that corresponded to the mobility and subsistence rounds of the fauna they hunted Large territories and extreme mobility can account for the great uniformity in tool kit assemblage over large areas (Funk 1978). Scheduling, sensitivity to annual fluctuations in game and climate, and familiarity with large geographic areas would have been essential. There was probably a certain amount of foraging as well (Funk 1978; Stothers and Campling 1974), which would have increased subsistence security.

Gardner (1977) states that the "coalescence of family and/or band social groupings of Paleoindians periodically formed to undertake tasks requiring larger social conglomerates, or when social reaffirmation of a regional macroband level of social organization was desired." These data are supported by Scoters who has proposed that three sites in the region are possible base camps of possible "sister" bands (Stothers 1982). Deller (1979) has proposed a group of Ontario-Michigan sites as winter habitations because of their exclusive utilization of non-local cherts. These foreign materials were utilized because local sources were obscured during the winter months.

In addition to an east-west interaction spanning Georgian Bay-Ontario-Michigan, there was a north-south interaction or annual round encompassing the Western Basin. Points manufactured from Upper Mercer chert from eastcentral Ohio have been found in the Western Basin, near Flint, Michigan, as well as in the Muskegon Valley, approximately 320 to 480 kilometers (200 to 300 miles) from the source (Wright 1981). With more amenable environments created by the retreating glaciers, humans could have brought southern traditions to the north (Stothers 1982). The interaction could have been seasonal, or with annual rounds including northern migration to the "glacial edge" environments and back to the south. The later Plano complex is thought to be representative of a "transitional" Paleoindian derived from the Plains (Stothers 1982). Initial Paleoindian influence seems to have come from the south, and later from the west.

ARCHAIC OCCUPATION (8000 B.C. to 1000 B.C.)

Temporal divisions of the Archaic include Early (8500 to 6000 B.C.), Middle (6000 to 2500 B.C.), and Late (2500 to 1000 B.C.). The division between the late fluted point hunters and their descendants in the Early Archaic (8000 to 6000 B.C.) is a purely arbitrary one (Griffin 1978). The continuous occupation of the northeast is in evidence from such regionally diverse stratified sites as the St. Albans Site in West Virginia (Broyles 1971); Modoc Rockshelter in Illinois (Fowler 1959); and Sheep Rock Shelter in Pennsylvania (Michaels and Smith 1967). Early Archaic tool assemblages reflect the influence of moderating climatic conditions and the resultant wider range of exploitable resources. Lanceolate projectiles are replaced by smaller notched and stemmed points used in the pursuit of smaller game such as deer and elk. However, the Kirk, LeCroy, and Thebes type points, which are ubiquitous to this general area, indicate the continued exploitation of large territories by small hunting bands (Dragoo 1976). The addition of sandstone abraders and mortars to the Early Archaic people's tool kit means that vegetable foods were becoming a more substantial part of their diet.

A paucity of Early and Middle Archaic sites in the northwest area of Ohio has been interpreted as an abandonment of the area between the late Paleoindian and Late Archaic periods (Fitting 1975; Funk 1978; Mason 1981; Ritchie 1969), although Mason (1981) considers Early and Middle Archaic as a gradual transition from one culture to the next. Archaeologically, the transition to Archaic occurred at the time of a warmer forested environment with forest-dwelling animals. According to this Ritchie-Fitting model of temporal abandonment of the area, between 8000 and 6500 B.C. little game existed in the coniferous forests of the Great Lakes and northeast, but after 6500 B.C. more deciduous forests invaded from the south. This was a more conducive environment for game. Lake levels were rising and the climate was warmer and drier (Fitting 1975). By 3500 B.C. a modern environment existed.

This model of environmental uniformity has limitations. The southern portions of the Great Lakes culture area would have sooner provided the requisite biotic variety to support human occupation than the northern ranges. The southern borders of the area do show a "small but widely distributed human population from the beginning of Early Archaic times" (Fitting 1975; Funk 1975). As such, this area still would have been a more marginal area for subsistence until deciduous forests were established (Mason 1981), and indeed low population density is evidenced in the archaeological record (Funk 1978). The migration hypothesis, that southern Early Archaic bands expanded to the north as deciduous forests pushed north, is evidenced in the Early Archaic points of southern-derived chert in northwest Ohio (Payne 1982). The well-established southeastern Archaic life way may have expanded north in part due to the budding off of larger donor populations.

The Middle Archaic is particularly elusive. The Middle Archaic is only easily recognizable on the eastern seaboard, in Tennessee, and Kentucky. Between Early and Late Archaic, there is a tendency toward regionally distinct complexes, projectile point types, and burial customs.

Archaic territories became more well-defined and assemblage diversity increased through time (Funk 1978). In the Early and Middle Archaic periods, seasonal rounds were doubtless as much a part of economic life as during the Late Archaic, but at a much lower frequency (Funk 1978). The Archaic lifeway tended to reflect the "logistic" pattern with well-defined seasonal rounds, territories, and home bases with many different activity sites (Binford 1980). Resource depletion or shifts could result in movement of home bases and/or site function. Greater stability and more frequent/longer use would tend to make base camps more visible in the archaeological record (Funk 1978).

In northern Ohio, Early and Middle Archaic sites are usually of two types: "those in which a single or a few points are included in a collection of material from other cultural periods, and those in which Early or Middle Archaic materials predominate" (Stothers and Pratt 1980). The first type is the most prevalent. The latter occurs predominantly adjacent to stream drainages, appearing "to be small habitation/exploitation areas, usually located on the edge of the small valleys" (Stothers and

Pratt 1980). The fall-winter sites represent inland encampments related to upland hunting, while spring-summer activities were conducted in riverine and/or lacustrine areas that are presently submerged by Lake Erie (Pratt 1981).

The Late Archaic in northern Ohio is represented by many excavated sites. Four Late Archaic site types have been identified for the region: spring-summer encampments, autumn hunting and collecting camps, winter hunting sites, and cemetery sites (Stothers and Pratt 1980). One Late Archaic site, 33Er436, is located within the project area (Barnes 2001).

EARLY THROUGH MIDDLE WOODLAND OCCUPATION (1000 B.C. to A.D. 500)

The Early Woodland period (1000-100 B.C.) appears to represent a cultural expansion of the Late Archaic. It is characterized by a greater tendency toward territorial permanence and an increasing elaboration of ceremonial exchange and mortuary rituals. However, some of these traits, once believed to be indicative of Early Woodland, are now known to have their origins in the Archaic (Dragoo 1976; Griffin 1978).

The introduction of ceramics to the cultural inventory constitutes the most recognizable trait of the Woodland period. As in the Late Archaic, Early Woodland sites in northern Ohio are still "located in lacustrine or riverine environments and appear to represent spring-summer encampments...The populations of these small spring-summer villages apparently dispersed into the interior areas in order to exploit deer and nuts during the autumn and early winter" (Stothers and Pratt 1980). The association of ceramics, hearths, and charred nut hulls has led to the suggestion that nut processing to extract oils was practiced (Osker 1977). This would indicate an intensification of subsistence activities (Stothers and Pratt 1980). Elaborate mortuary practices continued during the Early Woodland.

The Middle Woodland period (100 B.C. to A.D. 500) represents a time of complex sociocultural integration across regional boundaries via networks of trade. In Ohio, and much of the Ohio and Illinois River valleys, the predominant Middle Woodland culture is Hopewell. It is characterized by elaborate geometric earthworks, enclosures, and mounds that are often associated with multiple burials and a wide array of exotic ceremonial goods. However, the Hopewell interaction sphere may not have extended as far north as the Great Lakes, and if it did, it may only have been a weak association. In the Western Basin, two contemporaneous types of Middle Woodland occupation are found: the widespread non-Hopewellian Western Basin Middle Woodland, and a Hopewell-like Esch Phase from the Sandusky area (Stothers et al. 1979; Stothers and Pratt 1980). According to the range of Middle Woodland site types recorded in the area (Western Basin and Hopewell), the project area appears to rest in a transitional zone between the two cultural expressions. The Lake Erie area would have been in an environmentally transitional area outside the Lake Forest Biome characterizing most of the Hopewell interaction sphere. The very rich piscine resources of the Great Lakes (Rostlund 1952) and the flora, fauna, and relatively mild Carolinian climate of the interior riverine area (Cleland 1966) created an area where groups could have selected from many combinations of subsistence options (Stothers and Pratt 1980).

Thus, the Western Basin Middle Woodland ceramics and spring-summer fishing are characteristic of the north, while mound burials and maize represent later Hopewellian influence from the south. Esch Phase material culture shows Hopewellian ties, but lacks the Hopewell ceramics and cultigens (Stothers and Pratt 1980). The location of the study area between the northern non- or weak-Hopewellian cultures and the Hopewell to the south is significant in the interpretation of the regional cultural history and chronology.

LATE WOODLAND THROUGH MISSISSIPPIAN OCCUPATION (A.D. 500 to A.D.1643)

The Late Woodland through Upper Mississippian period has not been well defined for most of Ohio, but seems to present a north-south cultural dichotomy. Fieldwork undertaken by Prufer (1965), Baby and Potter (1965), Prufer and McKenzie (1966), and Murphy (1975) indicates that differential development of cultural trends was occurring on a regional basis. It is probable that established patterns existed longer in some areas than in others as a continuation of the Middle Woodland economy with the noticeable lack of elaborate Hopewell ceremonialism. By the end of this period, the adoption of corn, bean, and squash agriculture is evident. As a result, permanent villages were situated along terrace and bluff-base locations within the major river valleys.

In the western Lake Erie region the following Western Basin Late Woodland Tradition phases have been defined on the basis of changes in material cultural and settlement systems (Stothers and Pratt 1980; Stothers et al. 1994). As currently conceived, the Western Basin Tradition has its roots as far back as the Early Woodland and appears to represent a continuous cultural expression from approximately 2000 B.C. until A.D. 1300/1400 (Stothers et al. 1994). A series of time dependent phases has been forwarded by Stothers and others for the Late Woodland portion of the Western Basin Tradition and consist of Riviere au Vase , Younge, and Springwells (Stothers and Pratt 1980). Riviere au Vase is considered to be the earliest phase, dating from A.D. 500 to 1000 (Pratt 1981). The Younge Phase dates from A.D. 1000 to 1200, and the Springwell Phase from A.D. 1200 to 1400. The Western Basin Tradition ends approximately A.D. 1300 as associated groups were apparently displaced from their homeland by neighboring groups of the Sandusky Tradition which populated the entire region (Bowen 1992).

Occupying northcentral Ohio, east of the Western Basin Tradition and within the general project area, is the Sandusky Tradition. The Sandusky Tradition is believed to represent a long sequence of cultural evolution out of the Hopewellian Esch Phase (Stothers et al. 1994). The Late Woodland Sandusky Tradition is made of up five phases including the Green Creek Phase (A.D. 500-1000), Eiden Phase (A.D. 1000-1250), Wolf Phase (A.D. 1250-1450), Fort Meigs Phase (A.D. 1450-1550), and the Indian Hills Phase (A.D. 1550-1643). Stothers et al. (1994) argue that this sequence resulted in one or more groups believed to have been ancestral to the Assistaeronon or "Fire Nation" groups described historically. The end of the Sandusky Tradition is earmarked at A.D. 1643 which represents the time of dispersal by Iroquois-related groups (as cited in Redmond 1999).

In 1984, Stothers, Graves, and Redmond compared settlement and subsistence strategies of both the Western Basin and Sandusky Traditions and found several fundamental differences. They concluded that Western Basin Tradition groups practiced a settlement system that consisted primarily of small, upland based hamlets supported by numerous satellite extractive camps, which they felt closely related to historic accounts of Iroquoian lifestyles (Bowen 1992). In contrast, Sandusky Tradition groups were identified as practicing a "Upper Mississippian" settlement system that included large, riverine based villages with a greater reliance on corn.

The later Sandusky Tradition phases show a definite similarity to some Fort Ancient phases to the south, suggesting Late Woodland groups responded to Fort Ancient-Mississippian stimuli from the south. This is evidenced in changes "in ceramic technology; bone, antler, and shell artifact assemblages; burial pattern and settlement/subsistence adaptation" (Stothers and Pratt 1980). In addition, a population increase occurred as a result of increased sedentism and a shift to a more intensive agricultural base through time. Settlement continued in stockaded villages, many on bluff top areas of floodplains, in addition to seasonal encampments (Stothers and Pratt 1980). Defense appears to have been important. By the latter phases of the Mississippian, there is closer resemblance to the southern Fort Ancient.

There are two sites in the general region of the project area that possess evidence of Mississippian-like settlement: the Fort Meigs Site (33Wo8) displays evidence of Whittlesey-like ceramics (Pratt 1981), and the now-destroyed Orleans Park Site (33Wo74), also containing shell-tempered pottery. Site 33Wo8 is considered the type site for the late prehistoric Fort Meigs Phase of the Sandusky Tradition (Pratt 1981).

HISTORIC ABORIGINAL AND EUROAMERICAN OCCUPATION (A.D. 1701 to Present)

The central Lake Erie region can best be described as a complex mosaic of historic aboriginal occupation changing throughout time. There is an apparent cultural hiatus following the Iroquois wars which commenced in 1648. This conflict was the result of an attempt by the Iroquois nation to monopolize the Great Lakes fur trade. The Iroquois raids are legendary in their ferocity and intensity. This struggle resulted in the almost total depopulation of the central Lake Erie region. After the Montreal Peace Conference of 1701, groups began to drift back into the Ohio territory.

The first military contact in this area noted the presence of Indian groups, primary Wyandots who had migrated into northwestern Ohio from northern Illinois and southern Michigan. These Indian groups possessed mixed economies an lived in villages near agricultural fields along stream and river banks. A large Wyandot settlement existed in the Upper Sandusky area. An Ottawa village was established during the mid eighteenth century on the north bank of the Maumee River near the present site of Waterville, and another was established on an island in the river, now divided into the two islands of Indianola and Vollmars.

In the decades following Columbus's reports of the New World French explorers discovered a waterway which led them to the Great Lakes area and its river system. While they found an abundance of plants, animals, fish , and other natural resources, it was the potential of fur-bearing animals which caught their attention. In order to harvest the furs for trading, the French enlisted the aid of the Huron and Ottawa Indians in bringing the furs to trading posts, forts, and other rendezvous points. In exchange for these furs the Indians received guns, ammunition, knives, iron kettles, blankets, whiskey, trinkets, and other goods.

In 1679 the Count de Frontenac, governor of Canada, suggested bolstering French presence by establishing forts and trading posts along the Great Lakes and its rivers. In 1680 the French built a small stockade near the rapids of the Maumee River, near the site that the British built Fort Miamis a century later. Although the stockade became an important trading center for the region, in 1696 the post was abandoned by orders of the French monarch. The stockades would not be garrisoned again until 1715 (Tanner 1987).

With the end of the Seven Years War, Great Britain gained control of all former French territory in North America. Following the occupation by British troops of the formerly French forts, Pontiac, chief of the Ottawas, organized a confederacy of the Great Lakes tribes with the objective of removing the British from the region. The failure to capture Fort Detroit ended the rebellion and Pontiac's tribe proceeded to the Maumee Valley and settled south of Roche de Bout (Tanner 1987) In 1778 the Ottawa Indians moved one of the villages north of Roche de Bout near the Maumee Bay.

After the Treaty of Paris in 1783, the Great Lakes region transferred to the United States. The treaty stated that the British were to recall troops located in this territory. The British failed to comply and offered encouragement to the Indians not to concede the territory. The Indians would not recognize any treaty not signed by all of the tribes and insisted on the Ohio River as the approximate boundary between them and the American frontiersmen. They warned that American settlements north of the river would not be tolerated. When such settlements were nevertheless established, a series of raids was undertaken designed to drive out the settlers and discourage further settlement.

During the years between the signing of the Greenville Treaty 1794 and the War of 1812, the increasing population pressures caused by migration and settlement resulted in the cession of large tracts of Indian lands and Indian resettlement on smaller reservations. A series of treaties between 1805 and 1818 opened all of northwestern Ohio to American settlement. In 1817 a tract of 34 square miles was reserved on the Maumee River in sections of Wood, Lucas, and Ottawa Counties. After the Indian Removal Act of 1830, pressure to move west of the Mississippi was placed on remaining Indians in northwestern Ohio. The Ottawas ceded their land in 1833, but many did not move until the late 1830s.

LOCAL ARCHAEOLOGICAL INVESTIGATIONS

The literature review conducted as part of this project reported that one previously recorded prehistoric sites had been documented in the project vicinity. Site 33Er436 was recorded in 1994 by Eugene Edwards and Dr. Jonathan E. Bowen. The site is located on upland property south of the project area. A preliminary documentation form was sent to the OHPO on May 25, 1994. One artifact was recovered from the site: a slate, notched, butterfly bannerstone. Mr. Edwards visited the project area again this year and completed a survey. His survey yielded a few pieces of debitage. His conclusion was that the project would not adversely impact Site 33Er436 or any other archaeological site (Barnes 2001).

CHAPTER IV. RESEARCH DESIGN AND METHODOLOGY

RESEARCH DESIGN

All archaeological study is based on the assumption that human cultural behavior is systematic in nature. Therefore, the materials resulting from cultural behavior will occur in patterns reflecting those systems. The purpose of this investigation is to identify cultural resources that might have been affected by the hydrologic channel and dike construction activities, and make recommendations for further work. Therefore, the research design was formulated using only general terms to avoid prejudice against a particular type of resource. The basic unit for evaluation of significance is the site. For the purposes of this study, a site is defined as the occurrence in situ of any cultural material or artificial feature. Site definition is not determined by set, arbitrary numbers of artifacts. Non-sedentary cultures, in particular, tend to produce sites that have very low artifact densities and variation. Thus, using a specific artifact threshold would tend to obscure these sites from archaeological recordation.

It is further assumed that cultural remains are deposited across a natural landscape subject to geological and subsequent taphonomic processes. Forces such as erosion, colluvial and alluvial deposition, soil formation, animal burrowing, and mechnical excavation activities affect the condition and context of archaeological remains. In addition, vegetation and present land use patterns affect the visibility of those remains. Therefore, techniques used to provide a consistent level of survey coverage across the project area were selected on the basis of these locally variable factors.

The research design employed for this project is intended for use in reconnaissance level investigations. The primary purpose of such investigations is to identify any resources that may have been affected by the activities undertaken. Following identification, a preliminary evaluation of each resource's potential eligibility for the National Register of Historic Places (36 CFR 60.6) will be conducted.

LITERATURE SEARCH METHODS

A literature search was conducted prior to survey to identify any previously recorded cultural resources located within 1.6 kilometers (1 mile) of the currently proposed project area, to identify any cultural resources investigations that had transpired in the vicinity, and to provide information on the expected types and locational parameters of resources in the region. The literature search included a review of the Erie County archaeological site inventory files and maps, and county histories.

ARCHAEOLOGICAL SURVEY METHODS

The assessment of the potential for the presence of cultural resources was derived from data gleaned during background research. Models for conducting archaeological survey are developed based on a number of criteria. In the case of cultural resources management surveys designed to fulfill the compliance requirements in the Section 106 process, a number of questions are relevant. As a Phase I survey, the primary function of the inventory is to ascertain whether or not the project will have, in this case has had, an effect on cultural resources that may be eligible for inclusion in the NRHP. In order to identify these resources effectively, a methodology must be developed that will locate cultural resources within the project APE that may meet the criteria of eligibility.

The current survey area has been defined as the hydrologic channel and earthern dike that have been constructed in East Sandusky Bay to the west of Sheldon Marsh State Nature Reserve . This unique wetland and barrier beach system characterized by a broad mudflat necessitated a two-stage approach to the Phase I archaeological investigations. The initial stage consisted of a standard Phase I investigation tailored to identify any prehistoric or historic archaeological sites located near the current ground surface within the proposed project area. The second stage of the Phase I investigations consisted of a sampling of the soil deposits contained within the earthen berm via hand excavation at Shovel Test ST-A1.

Archaeological survey methods utilized during the initial stage of the Phase I investigations consisted of a general surface survey of the entire dike, as well as a general surface survey of a 15-meter (50-foot) wide section of the mudflat abutting the dike to the north and abutting the excavated channel to the south. In areas where sufficient surface visibility allowed for an examination of the ground surface (surface visibility in excess of 50 percent) surface inspection of the ground surface was undertaken. All cultural materials identified were collected, bagged and provenienced sequentially by observation point number.

Barnes Nursery provided aerial photographs of the general vicinity of the project corridor. No engineering maps showing project corridor limits, permanent and temporary landmarks, vegetational variation, and construction impacts were available to orient field crews. As mentioned in the previous chapter, the project area has undergone such drastic transformation that topographic maps are of limited use. Orientation within the project area and an understanding of the changes undergone requires on-site inspection. Project sketches and topographic maps identifying the general location of the APE available at the US Army Corps of Engineers Buffalo District web page (www.lrb.usace.army.mil/orgs/update/barnes31401b.pdf) were retrieved to record survey data (See Appendix A). Sufficient information was included on the map to permit its alignment with existing maps. Notes were taken on surface and vegetation conditions, soil characteristics, dimensions and extent of any disturbance evident, and the amount and distribution of cultural materials present.

LABORATORY METHODS

PREHISTORIC ARTIFACT ANALYSIS

Lithic Analysis

Three levels of analysis were used on lithic artifacts: morphological, technological, and functional. The original goals of these analyses were originally described in Voigt et al. 1998 included:

(1) delimiting the spatial patterning of tool-manufacturing loci;

(2) discerning patterns in the use of expedient and formal tools;

(3) documenting differences and diachronic changes in lithic technologies among the cultural components represented at the site;

(4) modeling raw material procurement and use; and

(5) assigning formed hafted bifaces to established culturally or temporally diagnostic types for relative dating purposes.

Given the classes of lithic artifacts represented - and not represented - in the lithic assemblage, it became apparent that while the analytical systems could be used, certain research topics could not be addressed given the character of the lithic assemblage. The research questions defined as relevant and the resultant analysis processes are discussed below.

Morphological System

The analysis of lithic artifact morphology was conducted at two levels. At the first level, it was applied to all lithic artifacts to sort them into general classes for further analysis: core, debitage (chipped stone), implement (chipped stone and groundstone), and miscellaneous (raw material and fire-cracked rock). Chipped stone includes the products and by-products of the manufacture and maintenance of stone tools produced by percussion and/or pressure-flaking techniques. Members of this class must exhibit at least one of the following attributes: flake scars, striking platforms, or bulbs of force. Groundstone includes any piece of lithic raw material that exhibits evidence of having been pecked, battered, and/or smoothed. The miscellaneous class includes: (1) raw material that has not been intentionally modified; and (2) raw material that exhibits alteration brought about by human activity but not by design (i.e., fire-cracked rock). Each class was subjected to different levels of analysis, but all lithic material was classified initially using this system.

The second level of the morphological analysis involved the use of a descriptive system that focused on the various elements of formed artifacts to assign them to recognized stylistic types that have proven to be culturally or temporally diagnostic. The process included recording and describing the following attributes: basal preparation, hafting element, blade morphology, measurements of artifact size and of specific artifact elements, specialized working element, the extent of flaking, and artifact size.

Technological Analysis

Analysis of lithic technology was aimed at the identification of the lithic-reduction sequences represented by the debitage, bifaces, and tools recovered from the survey area. For debitage analysis, it was necessary to develop a minimum set of artifact attributes that could be recorded accurately and efficiently. The selected attributes also would have to be free from subjective inferences of flake types (Shott 1994). These sets of mutually exclusive variables were developed so a chipped stone artifact, whether a piece of shatter or a flake, could be assigned to a single debitage class. The analysis of the recovered biface focused on metric attributes and on determining where the specimen fit into the manufacturing sequence from raw material to finished tool.

Identification of raw material was conducted during this stage of the lithic analysis. In addition, all prehistoric materials were examined for evidence of heat alteration and/or damage. Replication studies have documented that heat treating of some chert varieties results in improved fracture mechanics (Callahan 1979; Purdy 1981; Whittaker 1994). Experimental results demonstrate that formed hafted bifaces were made longer, thinner, and wider with some heat-altered cherts. Heat alteration also results in some cherts exhibiting distinct changes in color or luster. Heat damage was identified by macroscopic evidence of crazing or potlidding.

All debitage was subjected to basic initial cataloging. This level of analysis included identification of flake type, segment, raw material, thermal alteration, utilization, count, and weight. Assigning a piece of debitage to a flake class was based on its possession of a specific set of co-occurring attributes. The flake classes used in the lithic analysis are presented below as defined in Voigt et al. (1998).

Debitage Analysis

<u>Decortication Flakes</u>
Primary Decortication Flakes. These flakes retain cortex on 100 percent of their dorsal face.

Secondary Decortication Flakes: These are flakes that retain cortex on 30 to 99 percent of the dorsal face and that exhibit one or more dorsal scars from previously detached flakes.

Subcortical Flakes

Primary Flakes: These are flakes produced during the initial shaping of tools and/or cores. Primary flakes exhibit a single triangular platform, a relatively prominent Hertzian cone at the point of impact. These flakes may exhibit scars of previously detached flakes on their dorsal surface.

Secondary Flakes: These flakes are produced during the intermediate tool and/or core shaping process. Secondary flakes are typically longer than they are wide and exhibit a single lenticular platform. These flakes do not exhibit a prominent Hertzian cone, are considerably thinner than the primary flakes described above, and display one or several scars from previously detached flakes on the dorsal surface. General reduction flakes constitute much of this category.

Thinning Flakes: This category consists of the distinctive flakes produced during the intermediate to late stages of biface production. Thinning flakes are longer than wide and exhibit an acute, lipped, and multifaceted platform. These flakes are slightly curved in cross-section and may have multidirectional or parallel ventral surface scars. These flakes are also known as bifacial-thinning flakes.

Shaping/Finishing Flakes: These flakes are byproducts of biface trimming or sharpening. Shaping/finishing flakes result during the final stage of biface manufacture. These flakes typically exhibit point and lipped platforms and are ovoid in shape with a slightly curved cross-section. These flakes also are small in size with many multidirectional scars on the ventral surface.

Resharpening Flakes: These are very small flakes exhibiting multifaceted platforms and evidence of use-wear on the dorsal surface or on the platform. These flakes are probably the result of tool maintenance activities.

Flake Fragments. These include indistinguishable proximal, medial, lateral, and distal flake segments.

Identifiable Cores

Flake Cores: These include free-hand multidirectional and discoidal (plano-convex) cores specifically prepared for the purpose of obtaining flakes as an end product. These cores contain flake scars removed in an unsystematic manner and lack a specially prepared platform.

Miscellaneous Flake and Core Debris

Shatter and Blocky Fragments: These categories consist of angular and blocky fragments that lack any evidence of a platform, bulb of force, or negative flake scars. Shatter and blocky fragments may occur during any stage of a reduction sequence; they may also occur as the product of fire-fracture or natural (non-cultural) processes.

Core Debris: Core debris consists of spent or exhausted cores that cannot be accurately classified according to specific core type.

Checked Pebbles: This category consists of pebbles or cobbles redeposited away from their natural source that have one or more flakes removed, presumably for the purpose of checking the interior quality of the material. Cortex on these pebbles and cobbles will be hard, rounded, and patinated due to the manner of transport.

CURATION

Artifacts recovered from the Phase I investigations will be temporarily curated at Gray & Pape's Cincinnati office while analyses are being conducted. Artifacts recovered during these investigations are the property of the landowner. All efforts will be made to return these materials to the property owner. This will require contact of the landowners by Gray and Pape to determine their wishes in reference to these materials. All artifacts not returned to the landowner, copies of field and laboratory records and documents, maps, photographs, and other relevant records will be curated at a qualified curational facility. Artifacts will be cataloged according to standards developed by the accepting institution. Data will be stored in a manner consistent with standards described in 36 CFR 79.

CHAPTER V. RESULTS OF THE ARCHAEOLOGICAL FIELDWORK

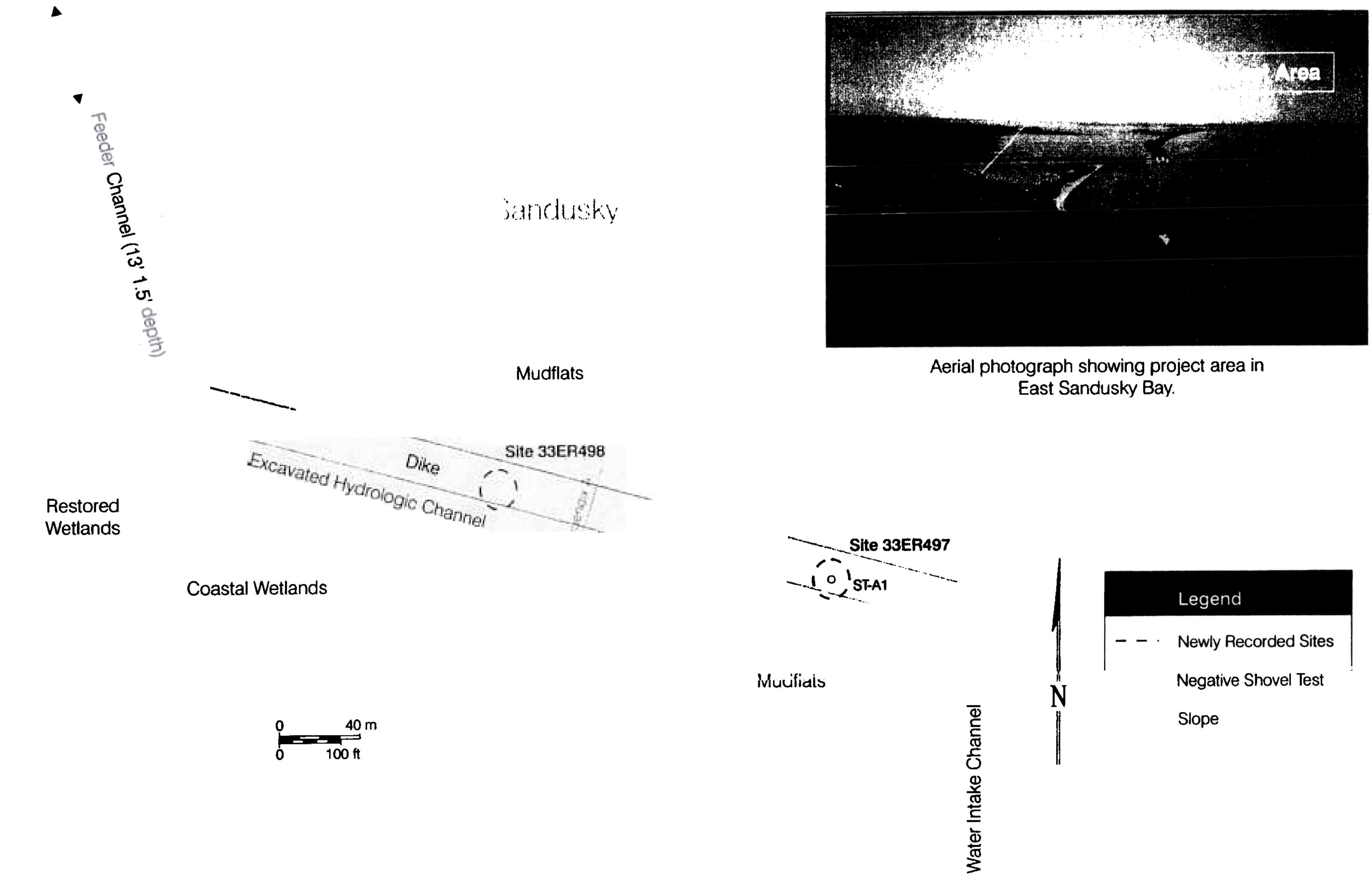
The project consists of an excavated hydrologic channel and earthern berm within a natural wetland and barrier beach system in East Sandusky Bay. The channel excavations joined a previously constructed (1970s) channel that connects to a pumphouse at its southern terminus to form an 'L' shaped canal. The previous channel and pumphouse have provided irrigation water for Barnes Nursery in the past, however decreased water levels in East Sandusky Bay necessitated the continuation of the channel for a total of 460 meters (1500 feet) to the west in hopes of increasing water access. The area is characterized by a broad mudflat to the north, a narrow mudflat to the south, and wetlands/marshlands to the east and west. The constructed earthen berm, or dike, measures about 460 meters (1,500 feet) long and 15 meters (50 feet) wide. The berm was constructed in July 2000 pursuant to Nationwide Permit No. 27 (2000-02170), issued by the US Army Corps of Engineers to Barnes Nursery, Inc. The earthen berm was constructed by sidecasting dredged material during the excavation of a hydrologic channel. This channel was excavated to permit water from an existing, natural drainage channel to flow into the hydrologic channel during low water periods and to serve as a conduit for enhanced wetland circulation. The channel measures about 460 meters (1,500 feet) long, 15 meters (50 feet) wide, and 1.5 meters (5 feet) deep (Appendix A).

As discussed in the report Introduction, archaeological resource identification efforts were focused on dredged sediments that comprise the earthen berm or dike. Surface observations were made across the entire length of the earthen berm, and along a 15-meter (50-foot) swath of the mudflat abutting the earthen berm to the north, and along a 15-meter (50-foot) swath of the mudflat abutting the excavated hydrologic channel to the south. Surface inspection of this southern transect included inspection of a portion of the western side of the 1970s channel. Much of the western side of the 1970s channel and all of the eastern side seem to have been built up for vehicle access, as this is the only high, stable ground in the project area.

In addition to the surface inspection, 1 shovel test (ST-A1) was excavated in the dike soils. The shovel test was excavated to a maximum depth of 80 centimeters below ground surface. The homogenous soil profile was identified as a yellowish brown (10YR5/4) clay with some silt. This soil has been identified as ancient lake clays (Savoy 1956) and represents the deepest soils excavated during construction of the earthen berm. This profile typifies the soils present in the semi-barren majority of the berm. Soils on which plant regeneration has been prolific contain not only the ancient lake clays, but are marked by the presence of very dark brown (10YR2/2) fine silts. These silts are characteristic of the marsh "muck" deposit that overlies the ancient lake clays. This modern deposit consists of decayed organic matter and ranges from a thin veneer to nearly 3 feet.

Surface inspection of the earthen berm identified 2 discrete scatters of prehistoric lithic artifacts within the matrix of the dredged lake sediments (Figure 2). Artifacts recovered from

01-39101



Aerial photograph showing project area in East Sandusky Bay.

Location of Project Area Showing Newly Recorded Archaeological Resources

GRAY & PAPE INC.
CULTURAL RESOURCES CONSULTANTS

Figure 2

Sites 33ER497 and 33ER498 were found in association with the ancient lake clays rather than with the overlying fine silts. Neither the shovel test nor the surface inspection of the mudflat buffer areas identified archaeological materials.

SITE 33ER497

The first artifact scatter is designated Site 33ER497 (Field Site 01-39101-01). The eastern edge of the site is located approximately 60 meters (200 feet) west from the eastern terminus of the earthen berm. The site measures 30 meters (100 feet) east to west and is distributed across the berm north to south. General surface collection methods resulted in the recovery of 10 chipped stone artifacts manufactured from an unidentified chert were recovered. The assemblage recovered from Site 33ER497 includes 4 primary flakes, 1 secondary flake, 2 flake fragments, 1 piece of shatter, 1 blocky fragment, and 1 utilized thinning flake (Appendix B).

SITE 33ER498

The second artifact scatter is designated Site 33ER498 (Field Site 01-39101-02). The eastern edge of this site is located along the dike immediately to the west of the Barnes' Nursery property line. The site measures approximately 40 meters east to west and is distributed across the berm north to south. The scatter consists of 3 surface finds and the assemblage includes 1 piece of fire-cracked sandstone, 1 utilized blade-like flake, 1 secondary flake, and 1 flake fragment (Appendix B). This site is roughly aligned with recorded Site 33ER436, where a notched butterfly bannerstone was recovered. Site 33ER436 is located on uplands to the south and west of the project area.

CHAPTER VI. CONCLUSIONS AND RECOMMENDATIONS

The Phase I archaeological survey of the constructed hydrologic channel and earthen dike in East Sandusky Bay, Erie County, Ohio, resulted in the identification of two previously unrecorded archaeological sites. These resources, Sites 33ER497 (Field Site 01-39101-01) and 33ER498 (Field Site 01-39101-02) are characterized by two small prehistoric lithic scatters, located along the surface of the earthen dike. The dike was constructed via the sidecasting of soils excavated during construction of the hydrologic channel.

Identification of sites 33ER497 and 33ER498 is directly linked to mechanical excavation activities used to construct the East Sandusky Bay Hydrology Restoration Project. The recovery of chert debitage, 3 utilized flakes, and 1 fragment of FCR indicate prehistoric human activity within the project area. However, because these artifacts were discovered in a matrix of deep lacustrine lake clays it is difficult, if not impossible, to interpret their context: Do these artifacts represent a buried occupation surface associated with low-level lake stages prior to uplifting at the Buffalo outlet? Do these artifacts represent eroded terrestrial deposits that have been redeposited in the deep lake sediments? Only extensive research beyond the scope of this study might shed light on these questions. At present, contextual integrity of the artifacts representing these two sites is sufficiently vague as to jeopardize further research value. Therefore, sites 33Er497 and 33Er498 do not meet criteria for NRHP eligibility.

All artifacts recovered during Phase I investigations were found in association with deeply deposited ancient lake clays. Since standard archaeological techniques such as hand excavation and surface observation methods would have been unlikely to identify these sites, the actions taken by Barnes Nursery have provided a unique opportunity to consider the types of "signatures" of human activity that may be present in these near-shore environments. A range of research questions and themes could be developed such as the applicability of various approaches to identifying sites in wetlands and barrier beach contexts and analyzing whether such near shore sites represent inundated terrestrial occupations or remnants of human activities in semi-submerged settings.

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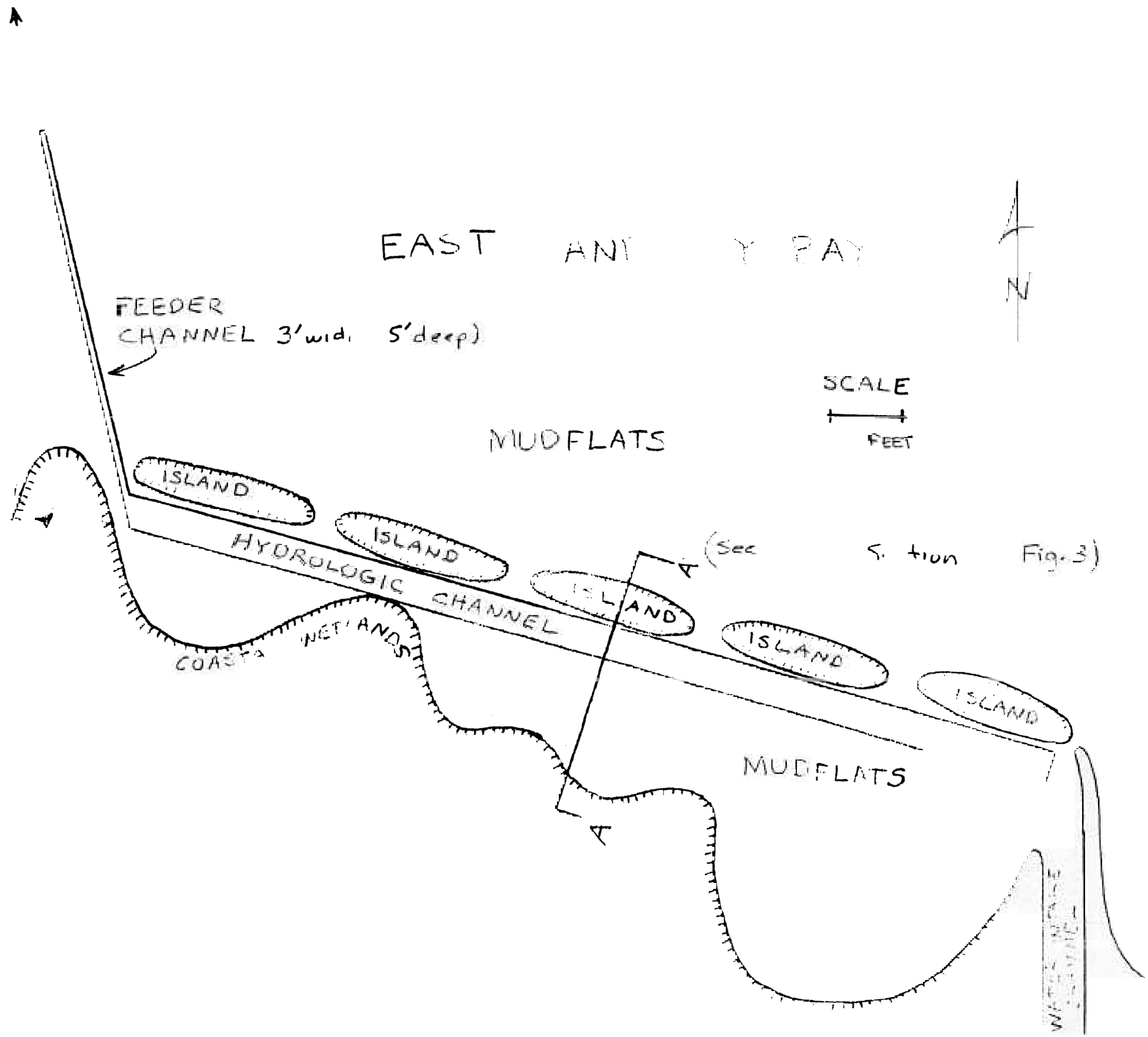
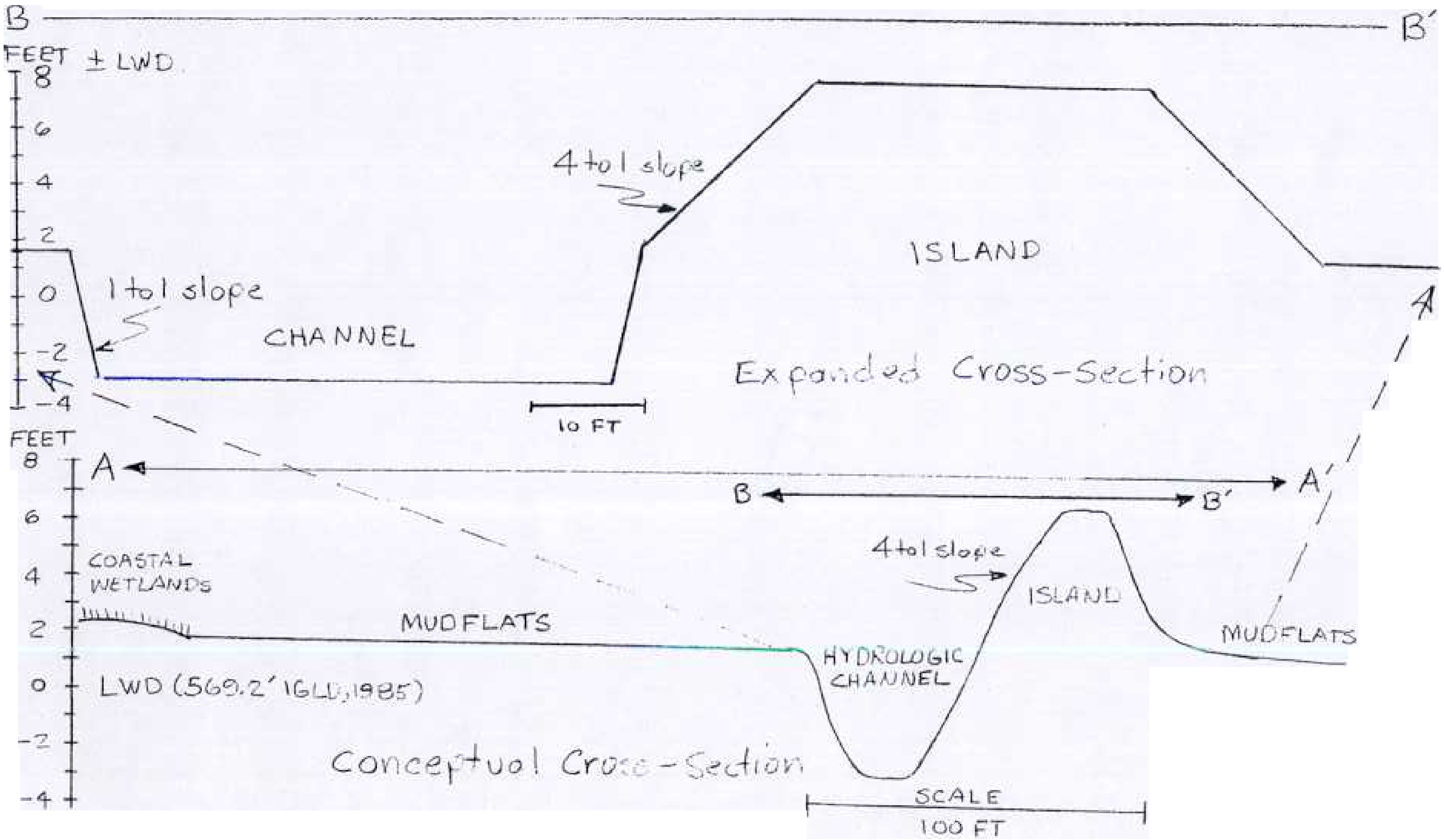
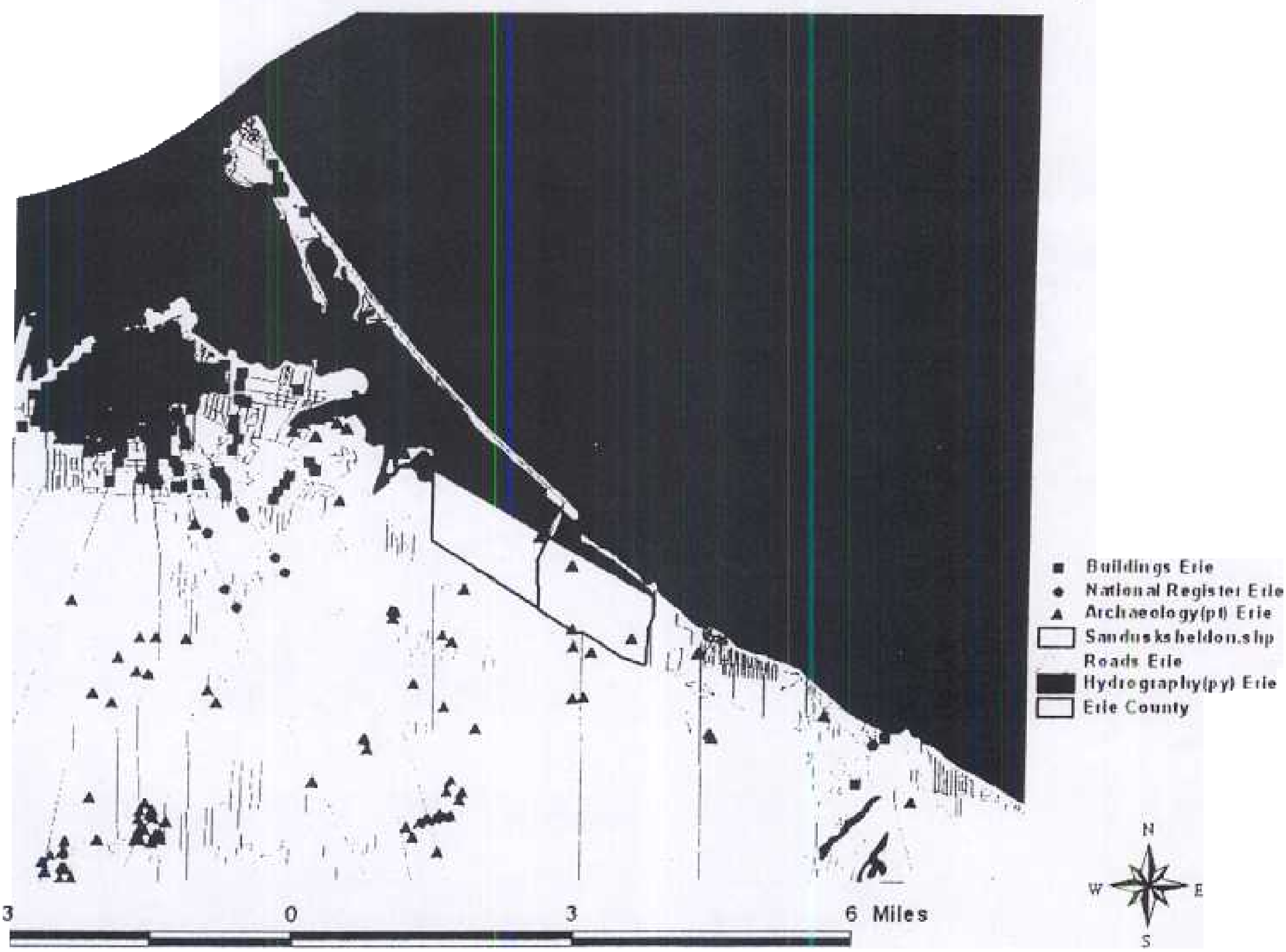
APPENDIX A: GRAPHICS FROM U.S. ARMY CORPS OF ENGINEERS BUFFALO DISTRICT WEB SITE (www.lrb.usace.army.mil/orgs/update/barnes31401b.pdf)

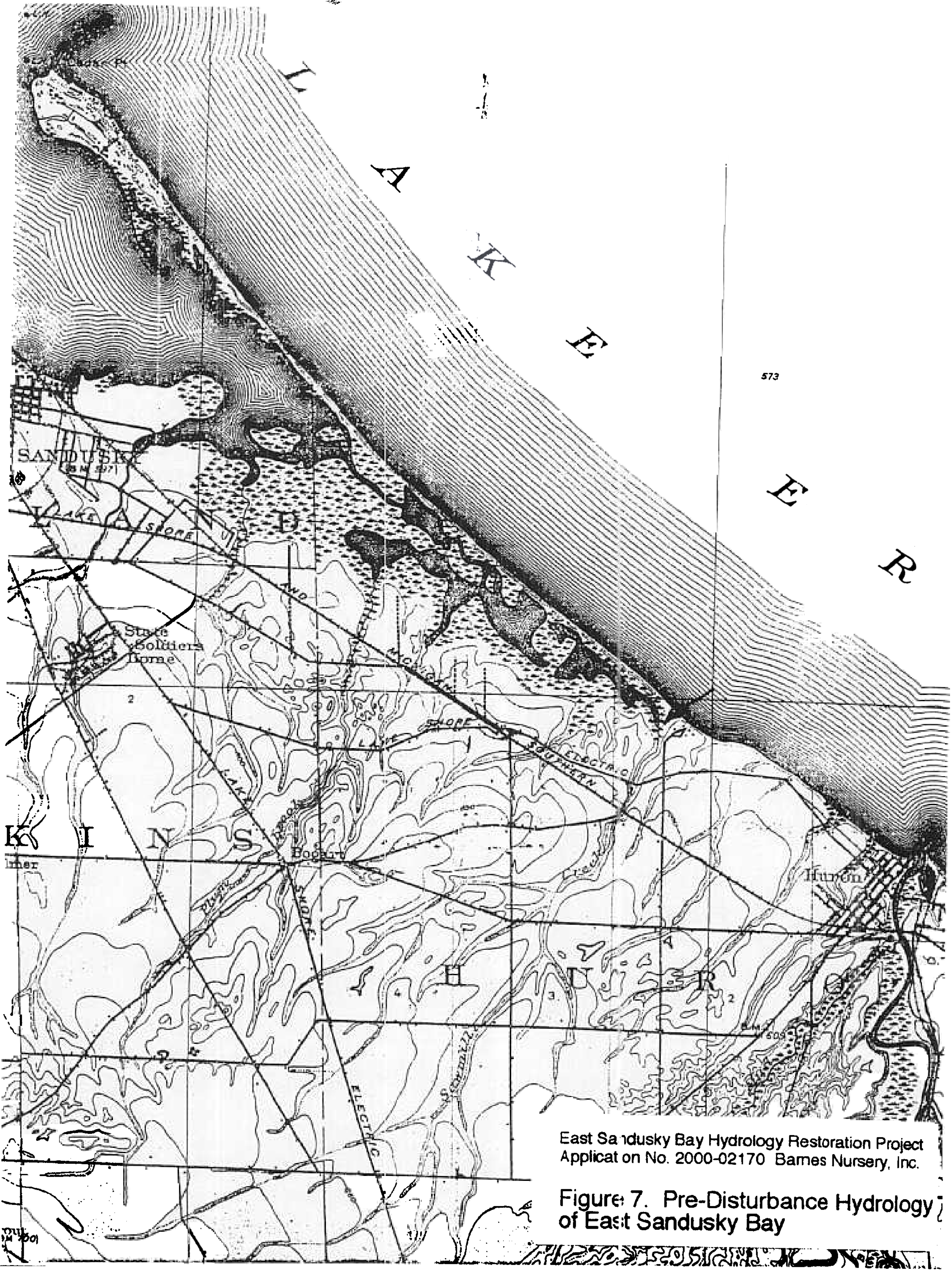

EAST ANT Y PAY
N
FEEDER
CHANNEL 3'wid. 5'deep)
SCALE
FEET
MUDFLATS
ISLAND
ISLAND
ISLAND
ISLAND
ISLAND
HYDROLOGIC CHANNEL
COASTA WETLANDS
A
A
(See S. tion Fig. 3)
MUDFLATS


B
B'
FEET ± LWD
8
6
4
2
0
-2
-4
1 to 1 slope
CHANNEL
4 to 1 slope
ISLAND
10 FT
Expanded Cross-Section
A
A'
FEET
8
6
4
2
0
-2
-4
A
A'
B
B'
COASTAL
WETLANDS
MUDFLATS
4 to 1 slope
ISLAND
MUDFLATS
HYDROLOGIC
CHANNEL
LWD (569.2' IGLD,1985)
Conceptual Cross-Section
SCALE
100 FT

Known Cultural Resources - Erie County

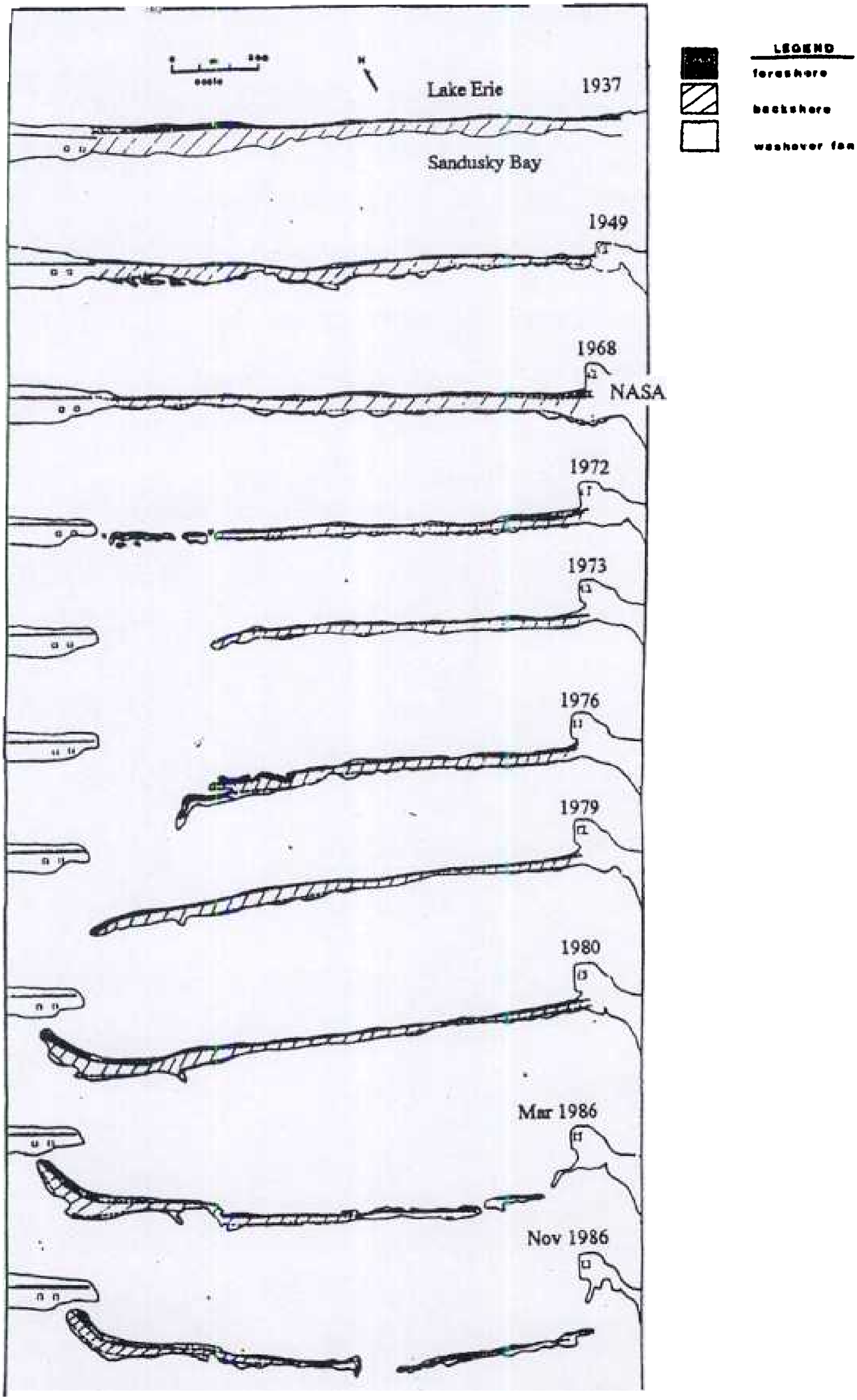


G

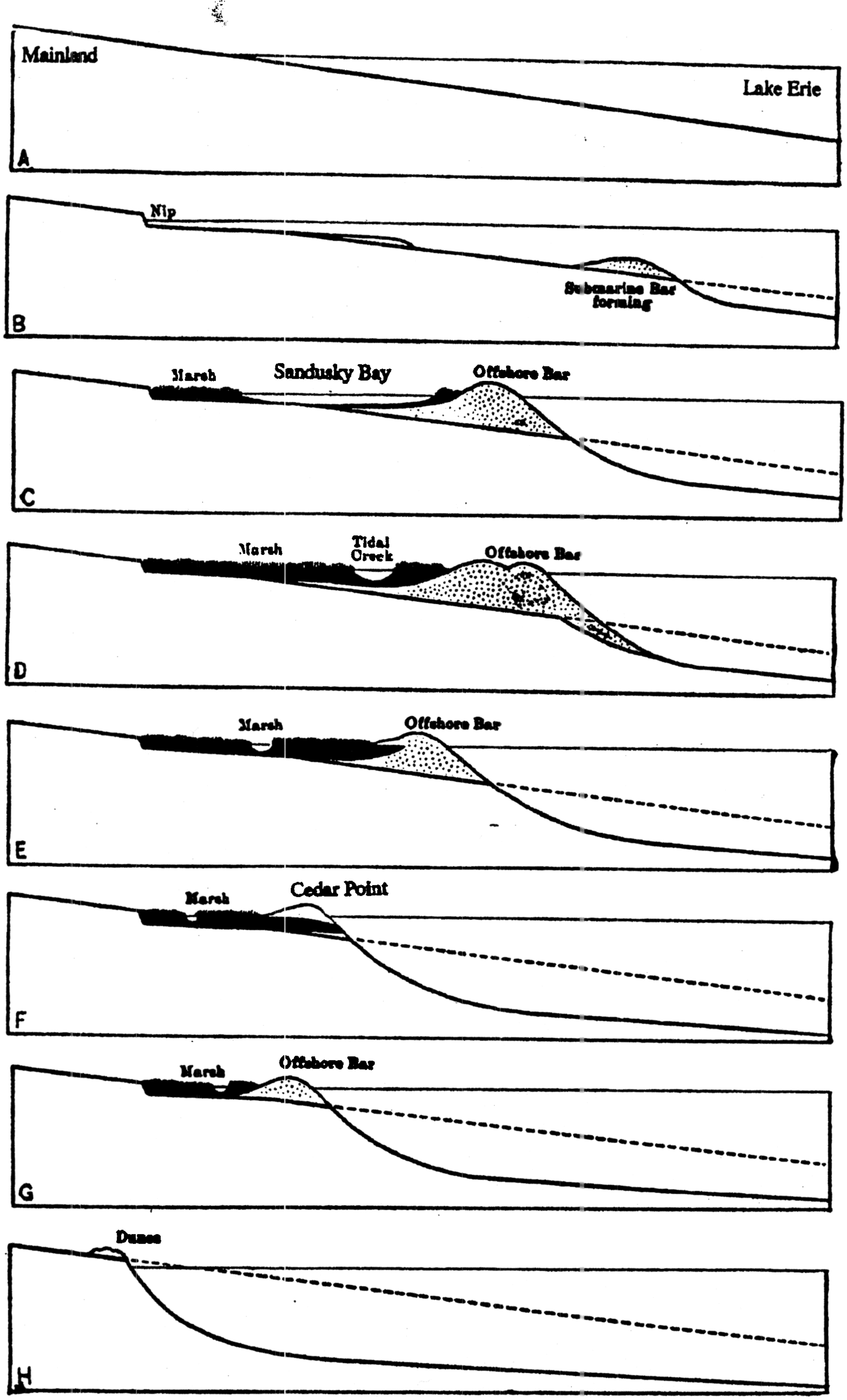


East Sandusky Bay Hydrology Restoration Project
Application No. 2000-02170 Barnes Nursery, Inc.

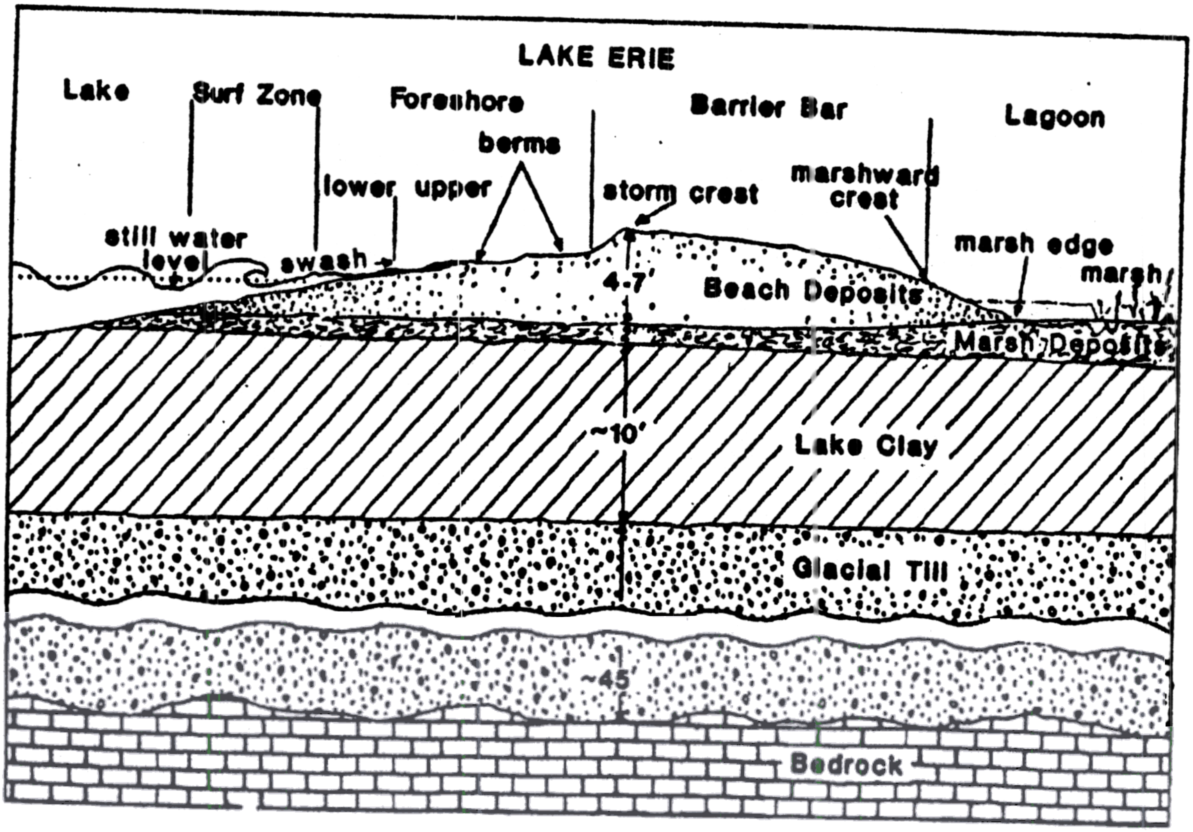
Figure 7. Pre-Disturbance Hydrology of East Sandusky Bay



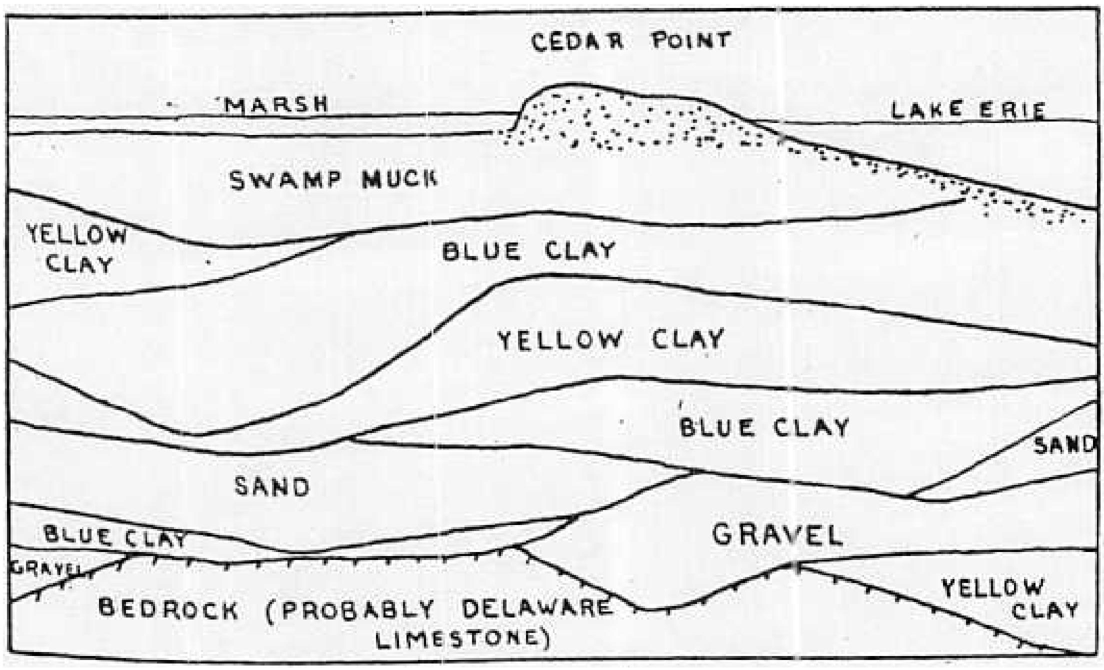
Changes in the morphology and position of Sheldon Marsh barrier bar from 1937 to 1986 (after Bray 1988).



Stages in the history of a transgressing bar (after Johnson 1965). Stage F simulates the current position of Cedar Point. Note the peat deposits exposed off the lakeward shore.

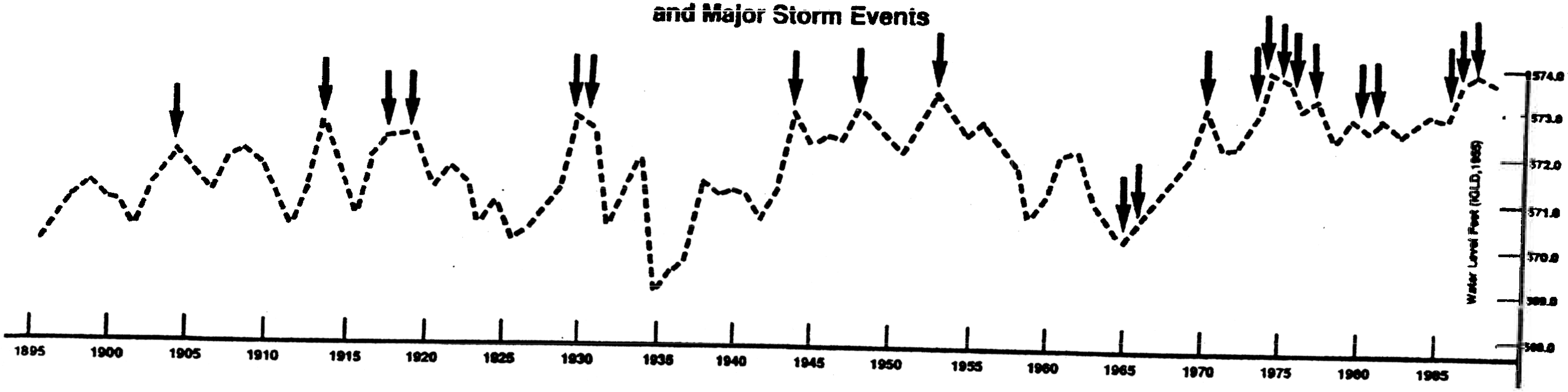


Cross-section of a typical barrier bar in western Lake Erie (after Savoy 1956).



Diagrammatic cross-section of Cedar Point (after Metter 1953). Note position of peat deposits under Cedar Point.

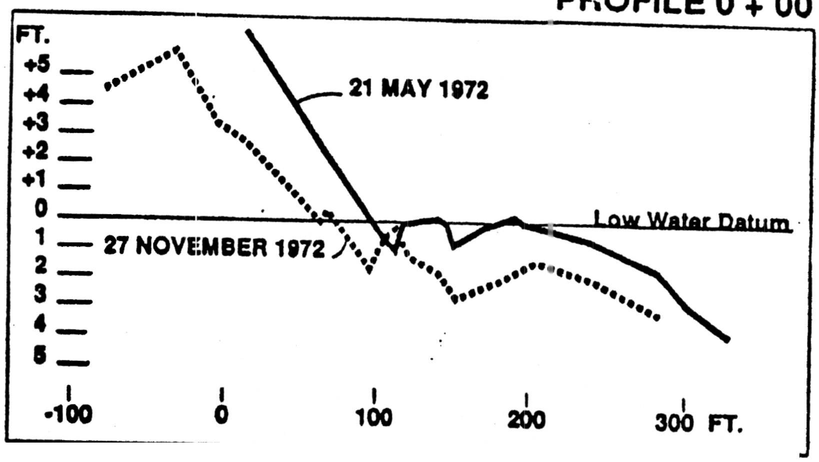
Long-term Fluctuation of Lake Erie Water Level and Major Storm Events



Major storm events that have effected Cedar Point in the past 100 years.

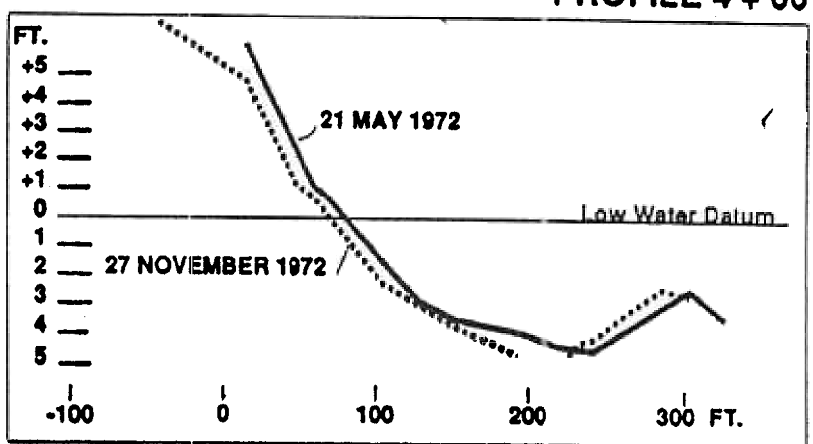
Sawmill Creek beach

PROFILE 0 + 00



Sawmill Creek beach

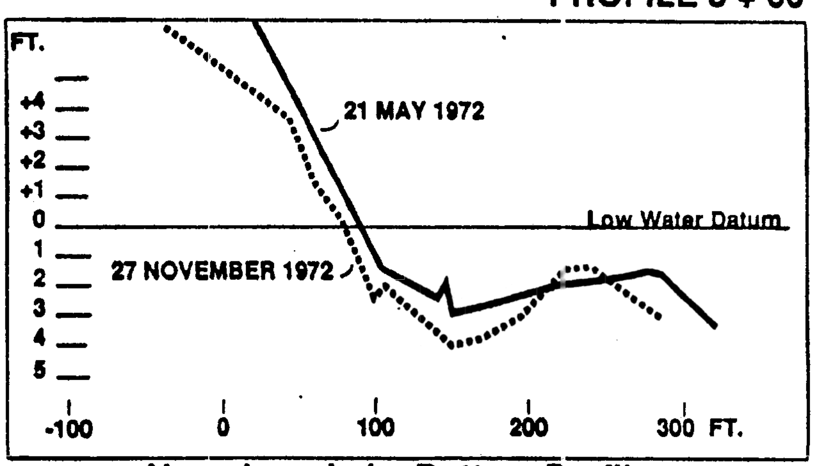
PROFILE 4 + 00



Nearshore Lake Bottom Profiles
Before and After November 1972 Storm

Sawmill Creek beach

PROFILE 8 + 00



Nearshore Lake Bottom Profiles

APPENDIX B:PREHISTORIC ARTIFACT INVENTORIES

State Site #	Trans.	ST#	Excavation Type	Group	Class	Type	Segment	Material	Heated?	Util	Ct	Wt.
		01	General Surface	Lithics	Debitage	Primary Flake	Whole	Unidentified Chert			1	
		01	General Surfa				Distal Fragment				1	
33ER497	A		ace	Lithics	Debitage	Primary Flake	Whole	Unidentified Chert		Yes	1	
33ER497	A	03	General Surface	Lithics	Debitage	Shatter	Indistinguishable	Unidentified Chert			1	
33ER497	A	04	General Surfa				Distal Fragment				1	
33ER497	A		General Surf ace	Lithics	Debitage	Primary Flake		Unidentified Chert			1	
33ER497	A	06	General Surface	Lithics	Debitage	Thinning	Whole	Unidentified Chert		Yes	1	
33ER497	A						Indistinguishable	Unidentified Chert			1	
		08	General Surface	Lithics	Debitage	Secondary Flake					1	
		09	General Surface	Lithics	Debitage	Primary Flake	Whole	Unidentified Chert	Damaged		1	
33ER498	A	10	General Surface	Lithics	Misc.	Fire Cracked Rock	Indistinguishable	Sandstone	Damaged		1	226
33ER498	A	11	General Surface	Lithics	Debitage	Blade-like Flake	Whole	Unidentified Chert		Yes	1	
33ER498	A	12	General Surface	Lithics	Debitage	Secondary Flake	Whole	Unidentified Chert			1	
33ER498	A	13	General Surface	Lithics	Debitage	Flake Fragment	Distal Fragment	Unidentified Chert			1	

4